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मानक

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IS 12107-1 (1987): Methods of chemical analysis of alumino-silicate refractory materials, Part 1: Determination of loss on ignition [MTD 13: Ores and Raw Materials]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

METHODS OF
CHEMICAL ANALYSIS OF ALUMINO
SILICATE REFRACTORY MATERIALS

PART 1 DETERMINATION OF LOSS ON IGNITION

1. Scope — This standard (Part 1) covers a method for determination of loss on ignition in alumino silicate refractory materials.

2. Sampling and Preparation of Sample

2.1 The sample shall be drawn in accordance with the procedure laid down in IS : 1528 (Part 7) - 1974 'Methods of sampling and physical tests for refractory materials : Part 7 Methods of sampling and criteria for conformity (first revision)'.

2.2 Laboratory Sample — The samples shall be crushed in any type of crusher with hardened tool steel faces with due precautions to prevent contamination of the sample with steel particles from the sampling equipment during crushing and grinding. After quartering, 20 g of the sample shall be carefully screened with a magnet to remove extraneous iron particles. It shall then be ground in an agate mortar so that it passes completely through IS Sieve 15 [aperture 75 μ m, see IS : 460 (Part 1) - 1985 'Specification for test sieves: Part 1 Wire cloth test sieves (third revision)'].

2.3 Test Sample — It is prepared for the purpose of chemical analysis by drying a sufficient quantity of the laboratory sample in a glass weighing bottle in air oven at 105 to 110°C.

3. Quality of Reagents — Unless specified otherwise, analytical grade reagents and distilled water shall be employed in the test.

Note — This clause is applicable to all parts of this standard.

4. General

4.1 Use of Filter Papers — In various parts of this standard, Whatman filter papers with their relative numbers have been prescribed since they are commonly used. However, any other suitable brand of filter paper of corresponding porosity and of equivalent quality may also be used.

5. Determination of Loss on Ignition

5.1 Reagents

5.1.1 Magnesium perchlorate (anhydrous) — Solid.

5.2 Procedure — Weigh 1.00 g of sample (see 2.3) into a previously weighed platinum crucible. Introduce it into a muffle furnace and slowly raise the temperature to $1025 \pm 20^\circ\text{C}$. Ignite the mass at this temperature for 1 hour. Remove the crucible and cool in a desiccator containing preferably magnesium perchlorate and weigh. Repeat the heating till constant weight.

5.3 Calculation

$$\text{Loss on ignition} = \frac{A - B}{C} \times 100$$

where

A = initial mass in g of the crucible with sample,

B = final mass in g of the crucible with residue after ignition, and

C = mass in g of the sample taken.

EXPLANATORY NOTE

Alumino silicate refractory materials contain alumina (Al_2O_3) and silica (SiO_2) in varying portions made synthetically by heating aluminium trifluoride at 1 000-1 200°C with silica and water vapour.

It is used in kilns, laddles and furnaces that operate at higher temperature or under conditions for which fireclay refractories are not suitable.

This Indian Standard has been prepared in several parts to cover the chemical analysis of various constituents in alumino silicate refractory materials. The other parts of the standard are:

Part 2 Determination of silica

Part 3 Determination of aluminium

Part 4 Determination of phosphorus

Part 5 Determination of titanium

Part 6 Determination of iron

Part 7 Determination of manganese

Part 8 Determination of calcium and magnesium

Part 9 Determination of sodium and potassium.